Habitats Breakout

October 6th, 2004
SOLEC 2004

Discussion Worksheet Questions and Answers

Number of Worksheets Submitted: 14

Focus Question 1: What are these indicators telling us? Are the individual indicators and overall assessments correct and useful? Are they telling us things that can lead to better restoration and protection of the Great Lakes basin ecosystem?

Not Useful:

- Focus on water/sediment quality (111, 118, 119)
- Groundwater flow (7100, 7101, 7102, 7103)

Nothing on surface flows (water quantity, natural flow regime), energy (stream power), and estuarine/nearshore processes
Major Deficiencies: lack of processes, pathways, connectivity

What about zebra mussel density? How are new conditions going to be captures? Need to be monitored to be useful! Open Lake? This "bundle" poorly reflects open lake (e.g. hardened shorelines, groundwater). The coastal zones should be included with this bundle. Monitoring should be assessed for each indicator.
Primary Productivity should be mentioned because it can be monitored b satellite. These indicators tell us something but there certainly are gaps.

Groundwater is a solid (small) bundle, but an awkward fit under "aquatic habitat". None of the others are particularly good habitat indicators – what about extent of zebra mussel colonization, macrophyte beds, anoxia, and primary production. Between "coastal zones" (which equal shoreline) and open lake habitat we are missing the nearshore zone (spawning beds etc.) – not good bundling.

There is a paucity of physical and temperature indicators. What of benthic, sediment loads, erosion/deposition, structures (reefs etc) Combination in the bundles seems somewhat odd and inconsistent. Half of the indicators in the bundle don't seem to apply.

The overall assessments are very useful and do tell us the general trends in these indicators (open waters). This allows us to direct resources to appropriate restoration and protection. The groundwater indicators need to be expanded to greater breadth and representative of other areas.

Indicators may help high level management and communications to gain public buy-in, however, does not have much application to local management initiatives.

Trends seem to reflect my experience with Lake Erie issues. Chemical parameters are useful. Groundwater could be useful if extended to other watersheds. Shoreline hardening is required in Ohio if you are building in coastal erosion area. This just exacerbates the problem, further decreasing the health of the lake. Regulations (State/local) must more closely reflect the needs of the ecological system. Need to stratify IBIs for various areas (habitats/counties in Lake Superior are much different than Lake Erie).

- Indicators are telling us approximate status but not future trends and what is driving them
- Indicators and overall assessments are correct and useful in the general sense
- Not predictive enough; not aimed at identifying sources and causes
- Lots of things are missing but how do you look at all this in summary? Are there a smaller number of indicators that work for the larger set?

Some missing items:

- Sources and trends in sources, of phosphorus, could help us predict future trends and impacts, as well as recommend actions to control
- Are we measuring levels, sources, and impacts of chemicals that may have impacts at extremely low concentrations such as endocrine system disruptors? If not, they should be added.
- Are we measuring systems used to control water, levels for those controls and means to predict future trends and possible social actions (including shoreline management and water body connectivity)?
- Are we covering barriers to fish migration in tributaries? We should.
- We could use indicators that represent presence of natural state, or balance in our systems.

Need more indicators that measure ecological process. Pretty heavy on groundwater, which is difficult to measure. Need indicators that measure pathways/barriers; hydrologic conditions; shoreline alterations; contaminated sediments; temperature regimes; absence/presence of AIS that alter physical condition.

Indicators are a mixed bag; deal with various ecosystems; hardened shorelines (8131) and groundwater (7103) do not relate to open lake systems such as 118 and P loadings (111). Have to distinguish separate lake, channel and coastal communities. What about barriers: dams, weirs, to moments of biota between lakes; non-native species indicators; zebra mussels? These would be major indicators.

P concentrations and toxic concentrations in water and sediment are insufficient measured for open lake habitat. Hypoxia is critical measure of open lake habitat, primary productivity (or chlorophyll) via satellite imagery. Groundwater indicators are difficult to measure and not likely to tell us much about open lake habitat.

Focus Question 2: What refinements, simplifications, or enhancements would you propose: To the assessment process? To the bundling of indicators?

- Indicators of flow alteration
- Shoreline alteration/channel modification
- Sediment contamination
- Water contamination
- Thermal alteration index
- Sediment load – suspended, bedload
- Scale deposition

Local inputs (emerging)

- Cage aquaculture
- Industrial livestock production
- Manure dispersal (agriculture)

Offshore reef characterization

Cannot be simplified any more – this bundle already has too may gaps especially no mention of Dreissenids – Diporeia densities need to be included.
These suites need to be more flexible.
"If this is the short list it falls short". The most important change is impacts of dreissenids on open water habitats. Some indicator of extent needs to be here. It may be more appropriate to include "nearshore" bundle under aquatic habitat.

Too much is being missed – you can't safely say habitat is improving even if all these indicators [P], [Chem] and improving.

Eliminate 8131, 7100, 7107, 7102, and 7103. Add temperature, primary production, benthic structures and buoy data.

The new bundling of indicators doesn't solve the problems of grouping from before (in previous SOLECs). The open water aquatic habitat indicators are incomplete – there is no mention of biological or physical habitat indicators – only the chemical. We can't assess habitat without talking about biology.

Aquatic habitat bundle should be renamed as groundwater bundle. The habitat bundle should include indicators on physical habitat loss and degradation in the Great Lakes and adjoining watersheds (e.g. aquatic habitats – migration, spawning, nursery habitats, species at risk habitats, and impact of invasive species).

Bundle into "chemical" "physical" and "biotic" indicators? Current bundling for habitat doesn't give a clear picture of ecological health. Groundwater doesn't fit in "habiata section necessarily.

- First, identify all potentially useful indicators – the current list is incomplete – and sort those most applicable by geographic area/lake
- Second, trace back to sources, or actions impacting these indicators
- Third, identify actions we could take to influence the status of the indicators – affect the sources
- Forth, involve agencies in a formal process to identify the indicators most useful to their mission and activities
- Finally, seek formal commitment by agencies to take over a set of indicators and to develop and manage an interagency information source or decision support process available to all (including public)
- Try to cross the line from tracking to influencing
- To do this, we need to establish benchmarks – goals

The bundling of indicators should be considered from a process point of view; try and use physical criteria, before chemical, before biological. Recognize biological features may integrate a number of processes. Use an IBI type of indicators for wetlands and do sensitivity analysis for each of the Great Lakes; there might be differences that would be useful to recognize.

Move extent of hardened shoreline to "coastal zones". Open water habitat should consider hypoxia, sedimentation (TSS, sedimentation rate) and extent of mussel beds and cladophora (in nearshore) should be added. Move groundwater to coastal zone or create its own bundle.

Consider using probability distributions to set standards and report indicators data i.e. the phosphorus limit in exceeded if levels go above 10ug/L on 5% of the days of the year. Also, include Dr. Rees's ecological footprint measure.

Focus Question 3: What are the key management implications that emerge from evaluating the indicators in this category?

- Industry, NGO partners
- Refocus (or add) habitat protection mandates to local municipalities (provide authority)
- Improve linkages to planners, planning process – different political scales; link federal, provincial, and state to local, public and private

Management Challenge

- Protect essential habitats
- Restore essential habitats
- Preserve species
- Economic incentive – Tax benefits, reimbursement, quality of life/real estate
- Land acquisition
- Active management of conservation lands
- Planning linked/tied to habitats – maintenance of process and function

There is extensive overlap between bundles which creates confusion from a program and management viewpoint. How are bundles being used? What is the link between the indicators and management action? This link should drive the choice of indicators. Also need some physical context setters, changes that are natural responses and will overwhelm signal from anthro induced changes e.g. climatic cycles.

Indicators do not appear to have a practical management application or an appropriate scale. Indicators – policy, regulate; improve habitat.

It really comes down to local governments implementing the actions t benefit the resources. How do we make this happen?

- Why do these indicators matter and who uses them?
- How can we get agencies to care enough to maintain and act on them?
- How do we cross over from the science inherent in the indicators to the sociology/social context driving them? We do the science to influence people; we need socially meaningful indicators that are functional at the local, public level.
- How can we hand this over to municipalities, communities, those who set policy?
- Do we really need to be so detailed with the indicators and does this mean we are going to try to control everything at this level?
  OR
  Are there more simple, but inclusive indicators that represent state of balance, or the stat of basic environmental processes, that could serve us better? One such "bundle" could deal with water control for example.

They should be scalable so that local decision makers can use “bring it home”.

The bundle of indicators as provided is too diverse in that it is measuring various types of aquatic ecosystems. Wilcox and sensitivity analysis of IBIs.

Fate of toxins linked to sediment concentrations. Link watershed loading of nutrients (P), TSS and other contaminants to open lake and sediment concentrations, eutrophication, and habitat.

Address the root caused of environmental problems as described by Dr. Rees. Than the long-term prognosis these indicators measure will improve. Ignoring Dr. Rees = foreclosing the future i.e. live off the earth’s interest, not its capital.

Other Comments

SOLEC 2005 Draft Report, p 7, Habitat Degradation
How to protect most essential habitats?

1. Financial incentives for local communities to develop and implement watershed planes/conservation action and to ID areas suitable for development
2. Work more closely with agencies and NGOs to ID and implement most effective conservation actions
3. Develop networks (government, NGOs, industry, etc. public, private) to ID, fund, and implement most effective conservation actions
4. ID most essential habitats and make justification for development/degradation much more strict with no exceptions e.g. wetland permitting

P 7 Questions, Management Challenge – Habitat Degradation

- Change the values of landowners
- Offer financial incentives
- Identify where habitats are primary and what makes them significant (islands, alvars, dunes, coastal wetlands)
- Think ahead – see what impacts might be. Habitats now might not be what they are in the future.
- Use existing material “ Framework for Guiding Habitat Restoration in Great Lake AOCs” – based on science
- Strategic acquisition and restoration
- Public education takes a long time – need to act before that takes effect
- Essential? Why? Contain SAR, important watershed functions